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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/597,524	06/20/2000	Harry J. Beatty, III	FIS9-1999-0319-US1	5261

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EXAMINER

ALI, SYED J

ART UNIT	PAPER NUMBER
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2127

DATE MAILED: 07/31/2003

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/597,524	BEATTY, III ET AL.	
	Examiner	Art Unit	
	Syed J Ali	2127	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2,3</u> | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 contains grammatical errors rendering it indefinite.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5, 7-9, and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Achenson et al. (USPN 6,477,586) (hereinafter Achenson) in view of LiVecchi (USPN 6,427,161) (hereinafter LiVecchi).

As per claim 1, Achenson discloses a method of parallel processing comprising:

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providing a first thread which represents an independent flow of control managed by a program structure (col. 5 line 26 - col. 6 line 63, "The thread and queue pairs, in blocks 40, 42, 44 as shown in Process 1 are referred to as worker threads in the example of the preferred embodiment. Such threads are involved in the parallel processing of RPC request and response messages");

providing a second thread which represents an independent flow of control managed by a program structure separate from the first thread (col. 5 line 26 - col. 6 line 63, "Within process 2A is illustrated a dispatcher thread and associated queue, shown in block 100");

using the second thread to prepare work for the first thread to process (col. 5 line 26 - col. 6 line 63, "The dispatcher thread, as shown in blocks 100 and 102, in each process is responsible for passing an RPC request message to the appropriate available thread from the pool of worker threads within the process to permit the RPC message to be processed")

placing the work prepared by the second thread in queue for processing by the first thread (col. 5 line 26 - col. 6 line 63, "The dispatcher thread shown in block 100 determines which of the worker threads found in process 2A of block 32, is appropriate to handle the RPC request message. The message is placed in the appropriate queue relating to the thread which can handle the request");

LiVecchi discloses the following limitations of claim 1 not specifically disclosed by Achenson:

said first thread having two states, a first state processing work for the program structure (col. 3 lines 15-67, "If a request is waiting, the thread removes the request from

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the queue, and begins to process it”) and a second state undispatched awaiting work to process (col. 3 lines 15-67, “The idle thread may then ‘sleep’, whereby a system timer is used to cause the thread to wait for a predetermined period of time, and then ‘awaken’ to recheck the queue to see if work has arrived”);

if the first thread is awaiting work to process when the work prepared by the second thread is placed in the queue, dispatching the first thread and using it to process the work in the queue (col. 3 lines 15-67, “If a request is waiting, the thread removes the request from the queue, and begins to process it”);

if the first thread is processing other work when the work prepared by the second thread is placed in the queue, using the first thread to complete processing of the other work, access the work in the queue, and then process the work in the queue (col. 3 lines 15-67, “As each thread completes the work request it has been processing, it looks on the queue for its next request”).

It would have been obvious to one of ordinary skill in the art to combine Achenson with LiVecchi because Achenson fails to specifically disclose how to handle various states of execution for threads. LiVecchi thus provides a mechanism for handling the various states of execution, including threads that are active and currently processing tasks, idle and waiting for work, and active and waiting for work. These mechanisms for handling different states of execution are well known in the art, and although not specifically disclosed by Achenson, would apply to the multithreading architecture of Achenson very easily.

As per claim 2, Achenson discloses the method of claim 1 wherein the second thread continues to place additional work in the queue, and the first thread sequentially processes the additional work in the queue as it completes processing prior work (col. 5 line 26 - col. 6 line 63, "The dispatcher thread shown in block 100 determines which of the worker threads found in process 2A of block 32, is appropriate to handle the RPC request message. The message is placed in the appropriate queue relating to the thread which can handle the request").

As per claim 3, Achenson discloses the method of claim 1 wherein the second thread marks the work placed in the first thread queue as not complete (col. 5 line 26 - col. 6 line 63, "When the RPC request message is forwarded via connection 90, the hConn value of the RPC request is set to null", wherein the system knows that it is a new request if the hConn value is null).

As per claim 4, Achenson discloses the method of claim 1 wherein if the first thread is processing other work when the work prepared by the second thread is placed in the queue, and when the first thread completes processing of the work in the queue, using the first thread to mark the completed work as complete, wherein subsequent work from the second thread is made to wait until the previous work in the first thread is marked complete (col. 5 line 26 - col. 6 line 63, "The message receiver thread of block 72, upon receiving the message, updates the hConn value to the connect id of connection 90", "the RPC response is returned to Process 1 of block 30 via connection 90. The correct connection is determined by reference to the hConn value found in the RPC message",

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wherein the determination for what path to use in sending the response is made from the hConn value in the RPC message, and also the updating of that value indicates that the message has been serviced).

As per claim 5, LiVecchi discloses the method of claim 1 wherein the first thread is reused to process other work (col. 3 lines 15-67, "As each thread completes the work request it has been processing, it looks on the queue for its next request").

As per claim 7, it is rejected for similar reasons as discussed above for claims 1-3. Specifically, all the limitations of the present claim are the same as if claims 1-3 had been presented as a single claim. Therefore, the citations above for claims 1-3 show where in the modified Achenson the present limitations can be found. Further, the motivation for combining Achenson with LiVecchi is discussed above in reference to the discussion of claim 1.

As per claims 8-9, they are rejected for similar reasons as claims 4-5, respectively.

As per claims 11-15, they are rejected for similar reasons as discussed above for claims 1-5, respectively. Specifically, both Achenson and LiVecchi are disclosed in relation to computer systems, with program storage devices tangibly embodying a program of instructions executable by a machine to perform the method steps of claims 1-5 (see Figs. 1-2 of LiVecchi). Further, all of the limitations of claims 11-15 are disclosed by the combination of Achenson and LiVecchi, as shown by the citations in the

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discussion of claims 1-5. Additionally, the motivation for combining Achenson and LiVecchi is discussed above in reference to the discussion of claim 1.

5. Claims 6, 10, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Achenson in view of LiVecchi in view of Voll et al. (USPN 6,170,018) (hereinafter Voll).

As per claim 6, the modified Achenson does not specifically disclose the method of claim 4 wherein the program structure destroys the first thread after it completes a desired amount of work.

Voll discloses the method of claim 4 wherein the program structure destroys the first thread after it completes a desired amount of work (col. 23 lines 28-37, "When processing by a particular thread completes, e.g., by execution of the computer instruction 'return', the thread is destroyed").

It would have been obvious to one of ordinary skill in the art to add Voll to the modified Achenson because once a thread has completed processing the work that is allotted to it, or completed a sufficient amount of work, it would be to the benefit of the system to destroy that thread. The reason for this is that an inactive thread occupies memory space that could be used for other purposes. By freeing these resources, more resources can be allocated to other threads, thereby increasing the throughput of the entire system.

As per claims 10 and 16, they are rejected for similar reasons as claim 6.

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Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J Ali whose telephone number is (703) 305-8106. The examiner can normally be reached on Mon-Fri 8-5:30, 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William A Grant can be reached on (703) 308-1108. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.



Syed Ali
July 27, 2003

MAJID BANANKHAH
PRIMARY EXAMINER
